

OGM Series oval gear flow meter

User manual



Shanghai Cowell Machinery Co., Ltd.

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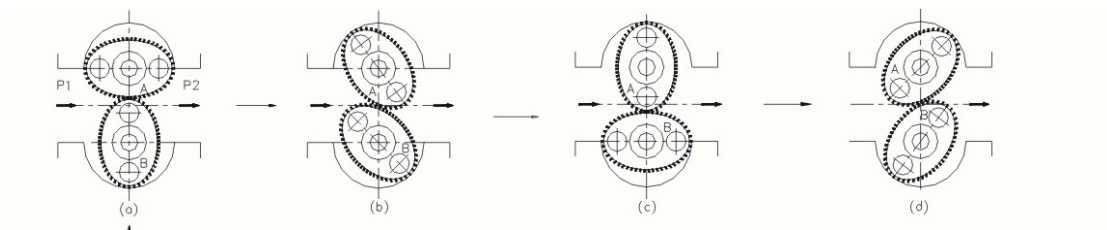
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1. Summarize

LC Series oval gear flow meter, the main type of positive displacement flow meters, is used to measure pressure in the pipeline closed under full pipe flow of the fluid flow. It has high accuracy, reliability, long life and wide range, small pressure loss, viscosity and good adaptation, is essentially unregulated measuring temperature, pressure change, and ease of installation. It is mainly used for measuring Petroleum, Diesel, Kerosene products of the cumulative flow. It can also be used for other chemical solution (except the corrosive agents) measurement. Direct Reading of the flowmeter accumulated fluid-flow meters, is equipped with a pair of oval gear switched from the measurement chamber, sealed coupling (a small-caliber flowmeter high sensitivity magnetic coupling) and technical institutions.

2. Working Principle

The liquid flow finished on the measuring room



Under the liquid differential pressure effect between import and export, there is a couple of oval gear on the on the measuring room, and it rotate continually on the shaft , measuring the amount of the rotation ,then know the liquid flow rate through the flow meter.

3. Main specification

[illegible]

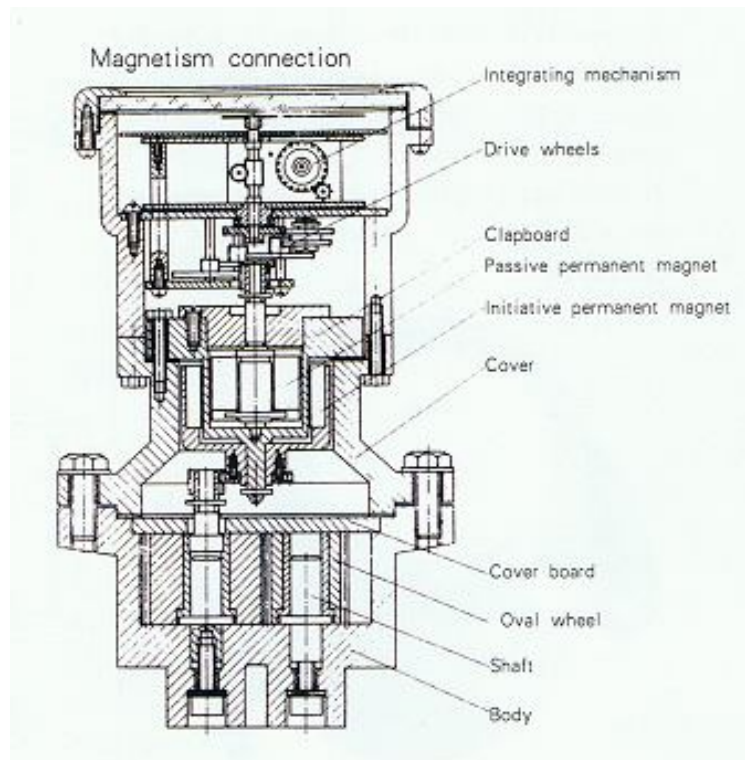
Pressure Mpa	
Pressure Lose Mpa	0.1
Liquid Viscosity Mpa.s	2---75

4. Structure

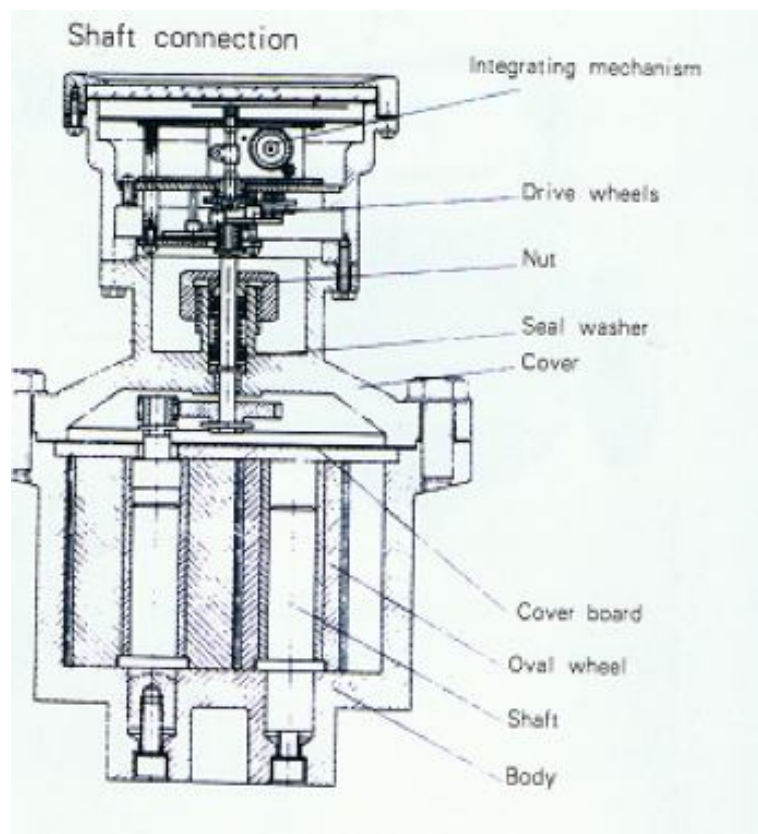
Picture1. The material of body is cast iron

Picture2. The material of body is 304 stainless steel

Picture1

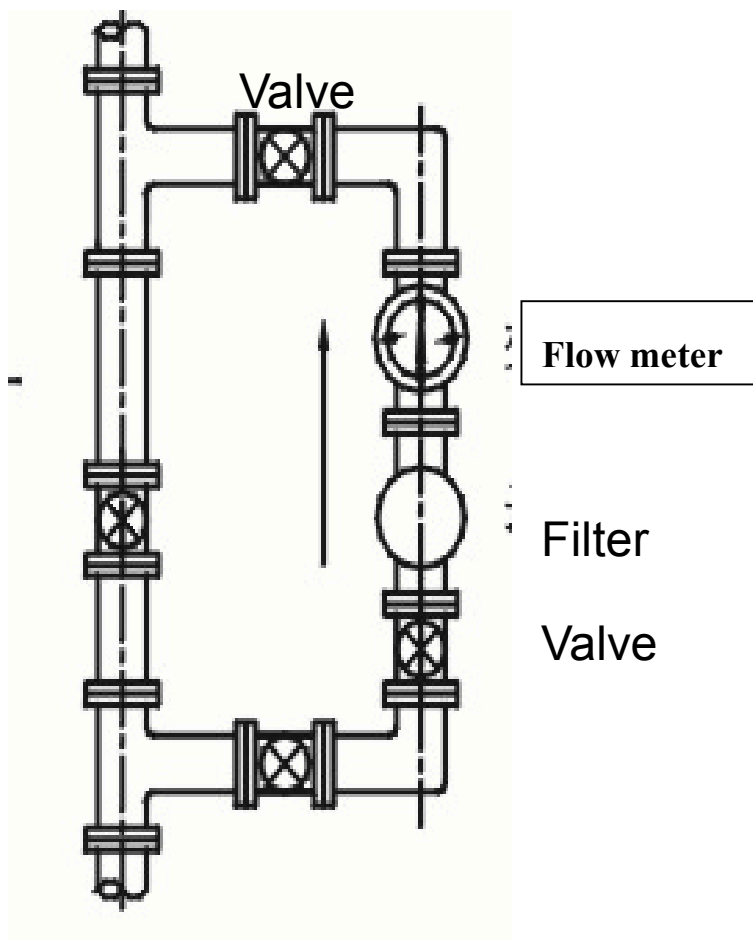
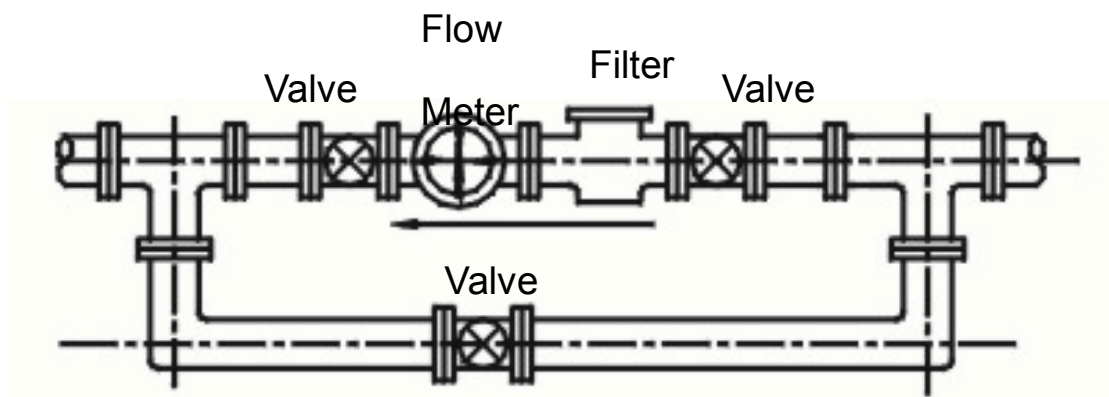


Picture2



5. Setting and Usage

- 1, The direction of setting meter should make the direction of arrowhead marked on the shell of the meter and flowing liquid be consistent.
2. The meter should better set in normal temperature, do not set in noxious gas and strong hot radiation situation, for fear parts of the meter would be damaged.
3. Oval gear flow meter should better set on the level position, so that to decrease the attrition of the both sides of Oval gear flow meter and the shell.
4. The meter should set on the fan-out of the pump, if on entry, the loss of the pressure on the filter would increase adding negative pressure, and more, the out-flowing liquid on turn of axes may lead increasing error. In order to reduce the error, the flange of the entry of the pump should make sure not seep gas.
5. A filter should be stetted on the front of the meter, limiting the atom over 0.2mm getting through, and avoiding jam the conduit, in this case, the filter is subject to clear.
6. The opposite valve should be stetted on front of the meter, letting the liquid should flow on single direction so that stopping damage the counter.
7. The advise as picture6, setting bypass and filter, it could set on the level apeak or other pipelines, from up to down, down to up, left to right or right to left all correct.



8. Using the meter, the inside should be fully filled with liquid and the testing liquid should not contain gas, or resulting in error on test.

9. Before setting, the pipeline on front of the meter should be cleared carefully. Only the meter attaching with the pipeline, the plug would be taken. So that sundries can not enter.

10. Beyond the maximum flow rate, the attrition of the oval gear flow meter would

increase with growing speed, and the pressure loss will forcefully rise. So, it should be averted. Under the minimum, it can count, but the error may increase and as the liquid viscosity at 10 centipoises showing on the meter, the flowrate at the beginning is about 1% of the full rate.

11. Producing each of the meter is calibrated using No.7 machine oil at room temperature. The viscosity of the oil is about 13 centipoises at normal temperature, changing with the room temperature. Theoretically the change of the testing liquid viscosity of the volumetric flow meter would not affect the measurement precision, but actually because of the interstice between the inside of measure room and the oval gear, the losing volume is changing with the liquid viscosity.

12. At the use of measuring the high consistency liquid, it should be heated to reduce the viscosity generally, and then flow on the pipeline. The liquid in the meter cools and becomes thick at the meter stopped. If turned on again, it must be heated using the steam by heating the liquid at the outside. After the liquid viscosity reduces, the meter can work, or the thick liquid may paste in and damage the part. Do not allow the bottom line steam through the surface to damage the meter.

13. The temperature of tested liquid should not over the standard. Over the standard, the meter may lock, and the change of the liquid temperature may affect to add deviation. The increasing temperature may lead to add the volume of moon shape space and "slow down the meter". If the testing room and the oval gear are made of cast iron, the add deviation is about +0.33%/100°C; If the testing room is made of cast iron and the oval gear is made of cast aluminum, the add deviation is about +0.14%/100°C.

14. The flow rate on the pipeline should not be increased and reduced forcefully, it should avert vibration and the phenomenon of waterpower impact and strongly undulation of pressure, and or it may affect the regular work of the meter.

15. The pressure loss and the square liquid flow rate are positive ratio, and with the liquid viscosity increasing, the pressure loss also adds.

Adjustment

Within the standard minimum and maximum range, the basic deviation of meter is not beyond $\pm 0.5\%$. The calculation method of the deviation indicated by percentage of the difference of accumulative indicated flow rate on the meter Q_{ind} and the actual flow rate of standard container Q_{act} with Q_{act} , as follows:

$$\text{Deviation} = (Q_{ind} - Q_{act}) / Q_{act} \times 100\%$$

The meter runs fast, deviation is indicated with "+"

The meter runs slow, deviation is indicated with "-"

To shorten the difference between meter and the actual flow rate, the meter sets a transmission ratio device, the adjust gear on the adjust board can exchange. Checking the meter choose proper adjust gear, to let the reading near the actual flow rate as far as possible. After used the meter a period time, the viscosity of testing liquid or temperature may change deviation and it is not same with the checkout deviation possibly. To make up the deviation, the following adjust gear list would be referenced. Choosing the transmission ratio adjust gear can purchase from us.

6. Adjustment-gear list

Original checkout result		Tooth amount of the gear	
Fast or slow	Deviation%	Z1 and gear7 inosculate	Z2 and gear6 inosculate
Fast <			

7. Checking and arrangement of malfunction

phenomena	Cause	Measure	remark
Oval gear can't move	1.In setting period, impurity get in and lock the oval gear	Remove and wash it, refix it according to the mark on the oval gear	New meter is subject to happen, according to the mark to set
	2. The testing liquid is not pure, filter is filled with impurity.	Wash the filter, clear the impurity	
	3.the pressure of testing liquid is low	Add pressure	
2.Oval gear can move ,but the pointer can not move	1.Transmission wheel lock	Clear the impurity and add lube	
	2.The rivet of gear loosening	Riveting the gear again	
3.Pointer wobble at turn back	1.Flow rate is higher than standard	Adjust it at the standard rate	
4.The turning oval gear make a unusual sound	1. Flow rate is higher than standard	Adjust it at the standard rate	
5.Pointer reverse and counter reverse	1.Direction of running liquid opposite to the direction of the marked arrowhead	Tear down and set it according to the marked direction	
6.Higher deviation and negative difference	1.The flow rate lower than standard	Exchange smaller caliber meter	
	2.Bypass leak	Check bypass	
	3.Usage beyond the limited time, oval gear have more wear and tear	Adjust the gear according to the change of deviation	
7. Higher deviation and positive difference	1.Liquid contain gas	To avoid leaking on flange joint, add a gas segregator on front of the meter	
	2.After check and the position of the counter is not at zero, leading wrong read	Correct the position Of pointer when counter running	To buy the adjust gear from producer or take it to the factory
	3.More difference between liquid viscosity and checking liquid viscosity	Exchange the gear base on the change of deviation	To buy the adjust gear from producer